a signal as the result of this process is then inputted to the terminal C of the voltage regulator 6 from the output circuit 91.

Here, when a high voltage pulse is applied to the output terminal of the alternator 1 due to a load cut-off condition or a connection failure on the power supply line 8, the power transistor 61 is turned off and a high voltage pulse is applied to the point F via the field winding 5. Therefore, the high voltage pulse is outputted to the terminal FR through the output terminal, field winding 5, FR output circuit 13 of the alternator 1.

Next, the high voltage pulse processing procedures within the external controller 9 will be explained. Fig. 21 is a flow diagram indicating the processing sequence of the CPU 92.

First, the CPU 92 detects the output terminal voltage of the alternator 1 based on the signal outputted from the terminal FR (step 201) to determine generation or not of a high voltage pulse (step 202). When the high voltage pulse is not generated, a negative determination is made. Thereafter, the CPU 92 outputs the high level signal to the terminal C to execute the normal power generation control (step 214), so that the regulated voltage is set to 14.5V. If the high voltage pulse is not generated, the processes of steps 201, 202, 214 are repeated.

When the high voltage pulse is applied to the output terminal of the alternator 1 due to load cut-off condition or connection failure of power supply line 8, positive determination is made (step 202). Next, the CPU 92 initially

sets the operating time t of a first timer to 0 (step 203), and thereafter compares the timer measuring time t with the predetermined time t1 (step 204). When $t < t1$, the CPU 92 counts up the number of pulses n (step 205). Here, when the number of pulses n is smaller than 2 (step 206), the processes after step 204 are repeated.

When the timer measuring time t reaches the predetermined time t1, the process of step 204 shifts to that of step 214 to execute the normal power generation control.

When the operating time t of the timer is less than the predetermined value t1 and the number of pulses n is two or more (step 206), the CPU 92 measures the pulse duration (step 207) to calculate the accumulated period A (step 208). Next, the CPU 92 compares the accumulated period A with the predetermined time Ar (step 209). When the accumulated period A is smaller than the predetermined time Ar, the processes after step 207 are repeated.

Meanwhile, when the accumulated period A becomes larger than the predetermined time Ar, the CPU 92 issues the predetermined failure alarm (step 211) and transmits a signal of low level to the terminal C to conduct power generation control (step 210). This control is continued for the predetermined period t2 (for example, 1 sec) (step 212). In addition, when the predetermined period t2 has passed, the CPU 92 resets the pulse count number n, and the accumulated period A (step 213), and shifts to the normal power generation control (step 214).

The high voltage pulse appearing at the output terminal

of the alternator 1 is detected as explained above. Particularly when a failure such as connection failure of the power supply line 8 is not generated, it is possible to discriminate the condition of single high voltage pulse generated when comparatively large capacitance electric load is disconnected with the condition of the high voltage pulses repeatedly generated irregularly within the short period when a contact failure is continuously generated because the power supply line 8 is not disconnected completely. Accordingly, when connection of the comparatively large capacity electric load is cut off, the output suppression control of the alternator 1 is not required as a response to such failure and thereby an unwanted drop of output voltage can be avoided.

Moreover, when a connection failure of the power supply line 8 is generated, the output of the alternator 1 is controlled to suppress generation of a high voltage pulse applied to the power Zener diode forming the full-wave rectifier 4. Thereby, temperature rise of power Zener diode can be suppressed effectively to prevent thermal breakdown.

In addition, since it is also possible to notify the driver of the generation of a failure on the power supply line 8 with the issuance of an alarm for the failure by discriminating the conditions of the high voltage pulses generated repeatedly, such a failure can be found quickly and irregular processes can also be prevented.

Moreover, in the structure of this embodiment, the existing system configuration can be used directly for the